Iris Flower Classification Task

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Introduction

This project involves the classification of Iris flower species using a machine learning model. The dataset contains measurements of three species of Iris flowers: Setosa, Versicolor, and Virginica. The aim is to train a model to classify these species based on their measurements.

Dataset Information

The dataset used for this project contains the following attributes:
- Sepal Length
- Sepal Width
- Petal Length
- Petal Width
- Species (target variable)

The data was preprocessed by handling missing values and dropping unnecessary columns.

Exploratory Data Analysis

Visualizations were created to understand the relationships between different features. A pair plot was generated to observe the feature distribution and separation of species.

Model Training

A Random Forest Classifier was used for classification. Hyperparameters were tuned using GridSearchCV to optimize the model's performance.

Evaluation

The model was evaluated using various metrics, including:
- Confusion Matrix
- Classification Report
- Accuracy Score
- F1 Score
- AUC-ROC Score

Feature importance was also visualized to identify the most influential features.

Conclusion

The project successfully classified the Iris flower species with high accuracy. The feature importance analysis provided insights into the most significant attributes for classification.